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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
BARHAM, BETHANY P				
ART UNIT		PAPER NUMBER		
1615				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com

oblonpat@oblon.com

jgardner@oblon.com

### Office Action Summary

**Application No.**

10/508,764

**Applicant(s)**

NGUYEN-KIM ET AL.

**Examiner**

BETHANY BARHAM

**Art Unit**

1615

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 March 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1.4.6-10.13.14 and 17-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1.4.6-10.13.14 and 17-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Summary***

Receipt of Applicant's Amended Claims and Response filed on 3/19/09 are acknowledged. Claims 1, 4, 6-10, 13-14, and 17-21 are pending. Claims 1, 4, 6-10, 13-14, and 17-21 are rejected.

## **NEW REJECTIONS**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 4 and 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Amended claim 4 and new claim 21 claims "greater than 0 and up to 10% by weight of E)" and "greater than 0 and up to 15% by weight of E)", which is not found in the instant specification. The instant specification teaches that E) is 0-15% or particularly 0-10% by weight [0174], in the instant claims (E) can be "greater than" 0% and "up to" 10 or 15%. Thus, Applicant has not established that he was in possession of the claimed ranges for this claimed ratio. For example,

Example 6 requires a 0.7 of poly-THF of a specific m.w. 1000 (A) component, and an exact amount of each component A-E, E) 1.2 of neopentyl glycol, etc., and not the ranges instant claimed. This is a new matter rejection.

Claim 1, 6-10, 13, and 17-21 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for polyurethanes of components A-E within specific disclosed weight % ranges and NCO/active hydrogen ratios, does not reasonably provide enablement for any polyurethane of A-E of NCO/active hydrogen ratios. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. The instant claim 1 has been amended to remove the weight % of components. This is a scope of enablement rejection.

Enablement is considered in view of the Wands factors (MPEP 2164.01 (a)). These include: (1) breadth of the claims; (2) nature of the invention; (3) state of the prior art; (4) amount of direction provided by the inventor; (5) the level of predictability in the art; (6) the existence of working examples; (7) quantity of experimentation needed to make or use the invention based on the content of the disclosure; and (8) relative skill in the art. All of the factors have been considered with regard to the claim, with the most relevant factors discussed below:

**The breadth of claims:** The instant claim 1 is directed broadly to "a crosslinked polyurethane obtained by reacting components of a composition comprising A) of at

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least one polytetrahydrofuran with a molecular weight of from 600 to 3000, B)trimethylolpropane (TMP), C)dimethylolpropanoic acid (DMPA), D)hexamethylene diisocyanate and isophorone diisocyanate, and E) neopentyl glycol, or a salt thereof, wherein components are present in amounts such that the ratio of NCO equivalent of the compounds of component D) to equivalent of active hydrogen atoms of components A), B), C) and E) is in a range of 0.8:1 to 1.15:1." It is the examiner's position that this claim is not supported by the instant specification, because the instant specification requires specific weight % of components A-E in order to achieve this polyurethane and ratio [0169-0180] and Examples require specific molecular weight of P(THF) and % weight of A-E resulting in the NCO/active hydrogen ratio instant claimed.

**The nature of the invention:** The instant invention is directed broadly to "a crosslinked polyurethane obtained by reacting components of a composition comprising A) of at least one polytetrahydrofuran with a molecular weight of from 600 to 3000, B)trimethylolpropane (TMP), C)dimethylolpropanoic acid (DMPA), D)hexamethylene diisocyanate and isophorone diisocyanate, and E) neopentyl glycol, or a salt thereof, wherein components are present in amounts such that the ratio of NCO equivalent of the compounds of component D) to equivalent of active hydrogen atoms of components A), B), C) and E) is in a range of 0.8:1 to 1.15:1."

**The state of the prior art:** As set forth in US 4,992,507; '507 teaches a polyurethane of specific components and specific weight % yields a ratio of active hydrogens to NCO

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groups of 1.0 to 2.0:1, which overlaps with the instant claimed ranges in claims 1 and 17 (Examples, col. 7, lines 36-40). The art teaches that the specific components P(THF), TMP, etc in specific weight % amounts are what give a ratio of active hydrogens to NCO groups of 1.0 to 2.0:1.

**The amount of direction provided by the inventor:** There is nothing in the specification that would indicate that the current invention is capable of working with any weight % of any of A-E resulting in the NCO/active hydrogen ratio instant claimed, but only the specific weight % of each component A-E disclosed in the instant specification. With respect to the instant composition, there is a substantial gap between a composition comprising a specific specific weight % of each component A-E and one comprising any weight % of each component A-E. Consequently, a burdensome amount of research would be required by one of ordinary skill in the art to bridge this gap.

**The presence or absence of working examples:** There are examples in the instant specification, which describe the process of making a polyurethane of specific % weight of each component A-E and especially Example 8 which teaches the components instant claimed in amended claim 1 with specific molecular weight of P(THF) and specific single weight % of A-E resulting in a single NCO/active hydrogen ratio within the ratio instant claimed. All examples refer combinations of P(THF), TMP, DMPA,

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IPDI, HMDI, and NPG, all of which are also taught and claimed by '507 and '507 also teaches an overlapping NCO/active hydrogen ratio with that instant claimed.

**The quantity of experimentation:** In the instant case, there is a substantial gap between a composition comprising one comprising any weight % of each component A-E resulting in the NCO/active hydrogen ratio instant claimed; and one comprising specific weight % of each component A-E resulting in the NCO/active hydrogen ratio instant claimed. Consequently, a burdensome amount of research would be required by one of ordinary skill in the art to bridge this gap. In order to utilize the invention as claimed, the skilled artisan would be presented with an unpredictable amount of experimentation. It is not clear what specific embodiments would be required in order for one of ordinary skill in the art at the time the invention was made to practice the instant invention commensurate in scope with the claims.

**The relative skill of those in the art:** the skill of one of ordinary skill in the art is very high, e.g., Ph.D. and M.D. level technology.

### **MAINTAINED REJECTIONS**

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4, 6-10, 13-14, and 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,992,507 ('507).

The instant claims are drawn to a crosslinked polyurethane obtained by reacting components of a composition comprising A) of at least one polytetrahydrofuran with a molecular weight of from 600 to 3000, B) trimethylolpropane (TMP), C) dimethylolpropanoic acid (DMPA), D) hexamethylene diisocyanate and isophorone diisocyanate, and E) neopentyl glycol, or a salt thereof, wherein components are present in amounts such that the ratio of NCO equivalent of the compounds of component D) to equivalent of active hydrogen atoms of components A), B), C) and E) is in a range of 0.8:1 to 1.15:1.

- '507 in Example 20 teaches a polyurethane comprising PTMEG (T-1000), (which is polyTHF 1000 molecular weight, instant component A), dispersing diol of DMPA (instant C), trimethylolpropane (instant component B), and Isophorone diisocyanate (instant component D). Also see Examples 1-9, which teaches a PPO-diol or polyTHF and further trimethylolpropane, DMPA (Dimethylolpropionic acid), isophorone diisocyanate, a dispersing diol and diethanol amine. Example 20 is taught above and teaches a polyurethane comprising (of solids) 38.7% PTMEG (T-1000) (instant component A), 1% trimethylolpropane (instant component B), 34.3% Isophorone diisocyanate (instant component D), etc. Examples teach varying the amounts of DMPA, IPDI, etc. and '507 teaches a ratio of active hydrogens to NCO groups of 1.0 to



2.0:1 (which overlaps with the instant claimed ranges in claim 16-17 (col. 7, lines 36-40)) (meeting the limitations of claims 1, 4, and 17).

- Furthermore, the polyurethane of '507 comprises various diisocyanates including hexamethylene and isophorone, and mixtures thereof (col. 2, line 67-col. 3, line 1), diols and triols (col. 3, lines 13-15) preferred dimethylolpropionic acid (col. 6, line 8), polyols specifically: neopenyl glycol, trimethylolpropane, and mixtures thereof (col. 4, lines 1-3). Dimethylolpropionic acid, trimethylolpropane, isophorone diisocyanates, and diols are preferred and used in the examples 2, 8-9 and 19-20 (Also see claims 1, 7, 9-11).
- '507 teaches an aqueous dispersion of polyurethane, which is useful as coating compositions (abstract). '507 teaches that polyurethanes are well-known as being useful for coatings and films (col. 1, line 13-15), and furthermore teaches that they may be employed as adhesives, binding agents, and coating compositions to be applied to any substrate, including wood, metals, glass, cloth, leather, paper, plastics, foam and the like, with various ingredients such as emulsifiers, organic solvents, etc added (col. 7, lines 45-66) (meeting the limitations of claims 7-10 and 14-15).
- Furthermore, the composition is a dispersion comprising 35% polymer and 75% solvents (meeting the limitations of claim 6 and 14). While Examples 8-9 teach other percentages of the same components can be used.
- '507 teach 250 and 1000 molecular weight poly-THF (Example 9, and 20) (meeting the limitation of claim 13).

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- '507 teaches adding an amine to end the reaction by reacting with the remaining isocyanate (see Examples, and col. 9, lines 5-9) (meeting the limitations of claim 18).
- '507 does not measure a K value or glass transition temperature (instant claims 19-20) or the claimed range for component C for the formed polyurethane, but such physical properties of K and Tg are a further characterization of the polyurethane and the fact that '507 does not measure them is not a teaching away.

A reference is analyzed using its broadest teachings. MPEP 2123 [R-5].

"[W]hen a patent simply arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, the combination is obvious". KSR v. Teleflex, 127 S.Ct. 1727, 1740 (2007)(quoting Sakraida v. A.G. Pro, 425 U.S. 273, 282 (1976). "[W]hen the question is whether a patent claiming the combination of elements of prior art is obvious", the relevant question is "whether the improvement is more than the predictable use of prior art elements according to their established functions." (Id.). Addressing the issue of obviousness, the Supreme Court noted that the analysis under 35 USC 103 "need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." KSR v. Teleflex, 127 S.Ct. 1727, 1741 (2007). The Court emphasized that "[a] person of ordinary skill is... a person of ordinary creativity, not an automaton." Id. at 1742.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to look to '507 in order to make a polyurethane of the instant invention. '507 teaches the same reactants to make a polyurethane, with substantially overlapping ranges and values or values near percentages as instant claimed for all components. One of ordinary skill in the art would know how to optimize the ranges of the components A-E of '507, as the MPEP 2144.05 states "Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." Further, the prior art teaches a composition and process for forming said composition described by applicants instant application, but applicants observation that it also has specific K value and glass transition temperature does not give it patentable weight, since it is the same composition and same process of making, as adding a characterization to a prior art patented invention is not patentable.

Claims 1, 4, 6-10, 13-14, and 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,992,507 ('507) in view of US 6,566,438 B1 ('438).

- '507 is taught above. '507 teaches a polyurethane of P(THF) (1000 m.w. disclosed), TMP and NPG and mixtures thereof, DMPA, IPDI and HMDI and mixtures thereof and a ratio of active hydrogens to NCO groups of 1.0 to 2.0:1.
- '507 does not teach the claimed range of component C in the instant application.
- '438 teaches a polyurethane coating composition comprising (see abstract, claim 1, Example B):

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- (instant A) 2-20% polyTHF (col. 3, lines 10-11),
- (instant B) 0.5-5% trimethylolpropane (col. 4, line 64),
- (instant C) 0.5-3% preferably dimethylolpropionic acid (col. 5, line 19) and 0.15-1.5% methyl-diethanolamine (col. 6, line 32) and 0.1-1% polyamines like ethylenediamine (col. 6, line 52) for a total of 5.5%,
- (instant D) 2-20% isocyanate in particular IPDI (col. 5, lines 56-59),
- and (instant E) father components.

A reference is analyzed using its broadest teachings. MPEP 2123 [R-5].

"[W]hen a patent simply arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, the combination is obvious". KSR v. Teleflex, 127 S.Ct. 1727, 1740 (2007)(quoting Sakraida v. A.G. Pro., 425 U.S. 273, 282 (1976)). "[W]hen the question is whether a patent claiming the combination of elements of prior art is obvious", the relevant question is "whether the improvement is more than the predictable use of prior art elements according to their established functions." (Id.). Addressing the issue of obviousness, the Supreme Court noted that the analysis under 35 USC 103 "need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." KSR v. Teleflex, 127 S.Ct. 1727, 1741 (2007). The Court emphasized that "[a] person of ordinary skill is... a person of ordinary creativity, not an automaton." Id. at 1742.

It would have been obvious to one of ordinary skill in the art at the time the invention was made that the polyurethane coating composition '507 could be made with the above claimed components in varying percentages overlapping with applicants as shown by '438. One of ordinary skill in the art would know how to optimize the ranges of '507 and '438, as the MPEP 2144.05 states "Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." '507 and '438 teach the exact compounds claimed in the instant application and the % weight of components overlap or are near to the amount claimed by applicants such that one of ordinary skill in the art would know how to experiment to obtain workable ranges.

### **Response to Arguments**

Applicant's arguments with respect to claims 1, 4, 6-10, 13-14, and 17-21 have been considered but are not persuasive and are moot in view of the new rejections necessitated by Applicant's amendment. Applicant's argue that '507 does not teach an embodiment with P(THF) m.w. of 600-3000, TMP, DMPA, HXDI and IPDI, and NPG with the NCO/active hydrogen ratio instant claimed. Specifically Applicant's argue that the combination of HXDI and IPDI is not taught. The Examiner respectfully disagrees as the prior art '507 teaches a polyurethane with an NCO/active hydrogen ratio that overlaps with the instant claimed ratio (as detailed above) and teaches P(THF) (specifically 1000 m.w. is disclosed), TMP and NPG and mixtures thereof, DMPA, HXDI and IPDI and mixtures thereof. Applicant is reminded that the rejection is a 103

obviousness type rejection and the prior art must be considered in its entirety and not limited to the Examples. A reference is analyzed using its broadest teachings. MPEP 2123 [R-5]. According to KSR, "[w]hen a patent simply arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, the combination is obvious". KSR v. Teleflex, 127 S.Ct. 1727, 1740 (2007)(quoting Sakraida v. A.G. Pro., 425 U.S. 273, 282 (1976). "[W]hen the question is whether a patent claiming the combination of elements of prior art is obvious", the relevant question is "whether the improvement is more than the predictable use of prior art elements according to their established functions." (Id.). Addressing the issue of obviousness, the Supreme Court noted that the analysis under 35 USC 103 "need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." KSR v. Teleflex, 127 S.Ct. 1727, 1741 (2007). The Court emphasized that "[a] person of ordinary skill is... a person of ordinary creativity, not an automaton." Id. at 1742.

Applicant's argue that the 103 rejection over '507 in view of '438 may overlap with some of the components but that the specific recited amounts of components A-E and A-E itself is not embodied, and the amount of crosslinking is not taught in the art. First with respect to crosslinking, the Examiner respectfully points out that the art teaches including trimethylolpropane ((B), a triol) which will crosslink the polyurethane to some degree and the range of the art is well within the range of (B) instant claimed. Trimethylolpropane has the same functionality when used in formulating a polyurethane

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and since the instant claims are not directed to a specific degree of crosslinking nor has Applicant provided a factual showing of evidence to prove that the degree of crosslinking is any different, the polyurethane of the prior art is crosslinked. Applicant also argues that the instant invention is obtained in a single step reaction rather than the 2-step reaction of '507 followed by further post-crosslinking. The fact that the polymer of Example 20 '507 is formed with the same components in two steps with the trimethylolpropane functioning to crosslink the polyurethane and is then further crosslinked is not a teaching away from the initially formed crosslinked polyurethane. Applicant has not claimed a specific percentage of crosslinking of the polyurethane and as such the composition of '507 is crosslinked by the presence of trimethylolpropane and meets the limitations of the claims. Also, the Examiner respectfully points out that A-E components are taught in the above Examples and cited sections of '507. The Examiner points out that many of the components A-E are taught in values that are found within the ranges instant claimed by Applicants. Thus the prior art of record teaches a crosslinked polyurethane comprising the same monomers as instant claimed and producing a ratio that is within the instant claimed ratio and the rejections of record are hereby maintained.

Applicants argue that that at most the art '507 in view of '438 teaches 4.5% of component C, however this is incorrect, as shown above the total is in fact 5.5% ( $3 + 1.5 + 1$ ). One of ordinary skill in the art would know how to optimize the ranges of '507 and '438, as the MPEP 2144.05 states "Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges

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by routine experimentation." '507 teaches varying component C (DMPA), while '438 teaches that 3 different reactants all meeting component C can be added to a urethane polymer, these general conditions and the fact that components A-B and D-E are taught in the instant claimed ranges, meet the terms of obviousness.

### ***Conclusions***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.



### **Correspondence**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bethany Barham whose telephone number is (571)272-6175. The examiner can normally be reached on M-F, 8:30 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward can be reached on 571-272-8373. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Bethany Barham  
Art Unit 1615

/Michael P Woodward/  
Supervisory Patent Examiner, Art Unit 1615